

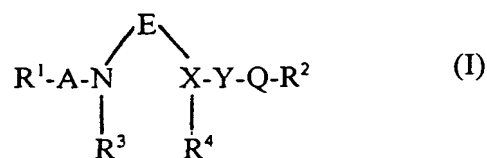
Appl. No. New Application

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1. (Currently Amended) A compound of the formula:



wherein R<sup>1</sup> is acyl;

R<sup>2</sup> is lower alkyl, lower alkoxy, lower alkylamino, lower alkenyl, lower alkenyloxy, lower alkenylamino, lower alkynyl, lower alkynyloxy, lower alkynylamino, cyclo (lower)alkyl, cyclo(lower)alkyloxy, cyclo(lower)alkylamino, aryl, aryloxy, arylamino, a heterocyclic group or amino substituted with a heterocyclic group, each of which may be substituted with ~~suitable~~ a substituent(s); or acyl;

A is a single bond, -CO- or -SO<sub>2</sub>-,

E is lower alkylene optionally substituted with ~~suitable~~ substituent(s),

X is CH or N,

Y is a single bond, lower alkylene or -NR<sup>5</sup>- (wherein R<sup>5</sup> is hydrogen, lower alkyl, substituted-lower alkyl, an N-protective group, aryl, acyl or a heterocyclic group),

Q is -CH<sub>2</sub>-, -CO-, -SO<sub>2</sub>- or -N=CH-, and

R<sup>3</sup> and R<sup>4</sup> are each hydrogen or lower alkyl, or ~~are taken together~~ are lower alkylene to form thereby forming a ring optionally condensed with a cyclic hydrocarbon or a

Appl. No. New Application

heterocyclic ring, provided that when X is N, then 1) Y is a single bond, and Q is -CH<sub>2</sub>-, -CO- or -SO<sub>2</sub>-, or (2) Y is lower alkylene, and a pharmaceutically acceptable salt thereof; with the proviso that simultaneously A is not a single bond, E is not ethylene, X is not -CH-, Y is not -NH-, Q is not -CO- or SO<sub>2</sub>- and R<sup>3</sup> and R<sup>4</sup> together are not ethylene.

Claim 2. (Currently Amended) ~~A~~ The compound according to Claim 1, wherein

R<sup>2</sup> is aryl, aryloxy or arylamino, each aryl of which may be substituted with halogen; pyridyl; or pyridylamino;

A is a single bond,

E is ethylene,

X is ~~CH~~ or N,

Y is a single bond, lower alkylene or -NR<sup>5</sup>- (wherein R<sup>5</sup> is hydrogen, lower alkyl or an N-protective group),

Q is -CH<sub>2</sub>-, -CO-, or -SO<sub>2</sub>-, and

R<sup>3</sup> and R<sup>4</sup> ~~are~~ taken together to form ethylene.

Claim 3. (Currently Amended) ~~A~~ The compound according to Claim 2, wherein

R<sup>1</sup> is lower alkanoyl, esterified carboxy, substituted or unsubstituted aryl, lower alkylsulfonyl, substituted or unsubstituted arylsulfonyl, or cyclo(lower)alkylcarbonyl, and

R<sup>2</sup> is aryl or arylamino, each aryl of which may be substituted with halogen.

Claim 4. (Currently Amended) ~~A~~ The compound according to Claim 3, wherein

Appl. No. New Application

R<sup>1</sup> is lower alkanoyl, lower alkoxycarbonyl, aroyl, aroyl substituted with halo(lower)alkoxy, lower alkylsulfonyl, arylsulfonyl, arylsulfonyl substituted with halogen, or cyclo(lower)alkylcarbonyl,

X is -CH-,

Y is a single bond or -NH-, and

Q is -CO- or -SO<sub>2</sub>-.

Claim 5. (Currently Amended) ~~A~~ The compound according to Claim 3, wherein

R<sup>1</sup> is lower alkanoyl, lower alkoxycarbonyl, aroyl, aroyl substituted with halo(lower)alkoxy, lower alkylsulfonyl, arylsulfonyl, arylsulfonyl substituted with halogen, or cyclo(lower)alkylcarbonyl,

X is -N-,

Y is a single bond or lower alkylene, and

Q is -CO- or -SO<sub>2</sub>-.

Claim 6. (Canceled) ~~A~~ The compound according to Claim 4, wherein

R<sup>1</sup> is lower alkanoyl, lower alkoxycarbonyl, aroyl, aroyl substituted with halo(lower)alkoxy, lower alkylsulfonyl, arylsulfonyl, arylsulfonyl substituted with halogen, or cyclo(lower)alkylcarbonyl,

X is -N-,

Y is a single bond or lower alkylene, and

Q is -CO- or -SO<sub>2</sub>-.

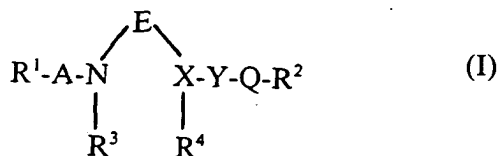
Claim 7. (Currently Amended) ~~A~~ The compound according to Claim 5, wherein

Y is a single bond, and

Appl. No. New Application

Q is -CO-.

Claim 8. (Currently Amended) A process for preparing a compound of the formula:



wherein R<sup>1</sup> is acyl,

R<sup>2</sup> is lower alkyl, lower alkoxy, lower alkylamino, lower alkenyl, lower alkenyloxy, lower alkenylamino, lower alkynyl, lower alkynyloxy, lower alkynylamino, cyclo (lower)alkyl, cyclo(lower)alkyloxy, cyclo(lower)alkylamino, aryl, aryloxy, arylamino, a heterocyclic group or amino substituted with a heterocyclic group, each of which may be substituted with ~~suitable~~ a substituent(s); or acyl;

A is a single bond, -CO- or -SO<sub>2</sub>-,

E is lower alkylene optionally substituted with ~~suitable~~ a substituent(s),

X is CH or N,

Y is a single bond, lower alkylene or -NR<sup>5</sup>- (wherein R<sup>5</sup> is hydrogen, lower alkyl, substituted-lower alkyl, an N-protective group, aryl, acyl or a heterocyclic group),

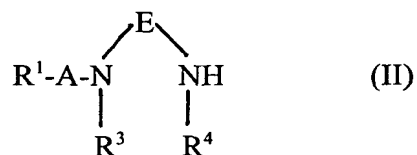
Q is -CH<sub>2</sub>-, -CO-, -SO<sub>2</sub>- or -N=CH-, and

R<sup>3</sup> and R<sup>4</sup> are each hydrogen or lower alkyl, or ~~are~~ taken together are lower alkylene to form thereby forming a ring optionally condensed with a cyclic hydrocarbon or a heterocyclic ring, provided that when X is N, then 1) Y is a single bond, and Q is -CH<sub>2</sub>-, -CO- or -SO<sub>2</sub>-, or (2) Y is lower alkylene, or a pharmaceutically acceptable salt thereof; with the

Appl. No. New Application

proviso that simultaneously A is not a single bond, E is not ethylene, X is not -CH-, Y is not -NH-, Q is not -CO- or SO<sub>2</sub>- and R<sup>3</sup> and R<sup>4</sup> together are not ethylene, which comprises; :

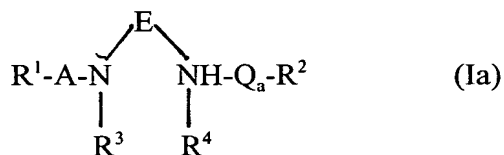
1) reacting a compound of the formula:



or its salt with a compound of the formula:

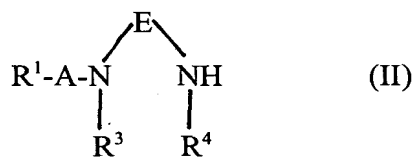


or its reactive derivative at the carboxy or sulfo group, or a salt thereof to provide a compound of the formula:



or its salt, in the above formulas, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, A and E are each as defined above, and Q<sub>a</sub> is -CO- or -SO<sub>2</sub>-.

(2) reacting a compound of the formula:

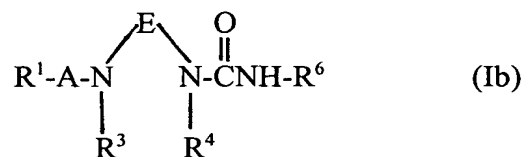


Appl. No. New Application

or its salt with a compound of the formula:

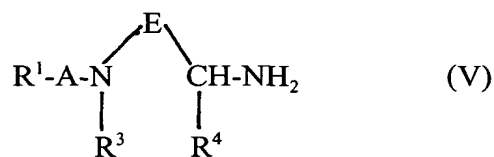


to provide a compound of the formula:



or its salt, wherein, in the above formulas,  $R^1$ ,  $R^3$ ,  $R^4$ , A and E are each as defined above, and  $R^6$  is aryl which may be substituted with ~~suitable~~ substituent(s); or pyridyl, or

(3) reacting a compound of the formula:



or its salt with a compound of the formula:

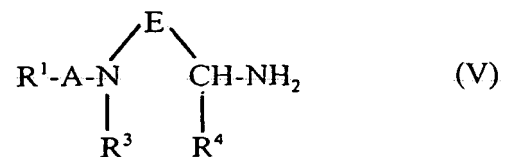


or its reactive derivative at the carboxy or sulfo group, or a salt thereof to provide a compound of the formula:



Appl. No. New Application

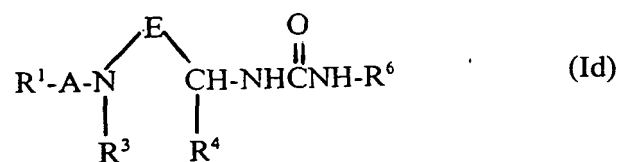
4) reacting a compound of the formula:



or its salt with a compound of the formula:

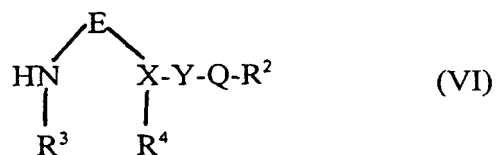


to provide a compound of the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}^3$ ,  $\text{R}^4$ ,  $\text{R}^6$ , A and E are each as defined above, or

5) reacting a compound of the formula:



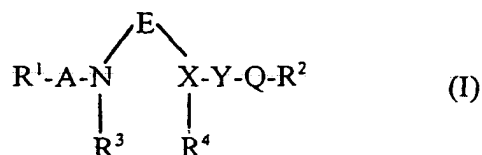
or its salt with a compound of the formula:



or its reactive derivative at the carboxy or sulfo group, or a salt thereof to provide a

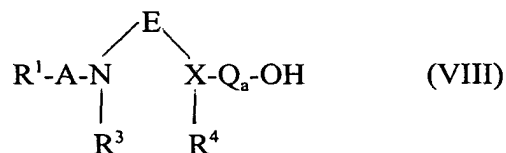
Appl. No. New Application

compound of the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A, E, X, Y and Q are each as defined above, or

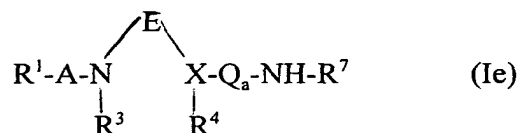
6) reacting a compound of the formula:



or its reactive derivatives at the carboxy or sulfo group, or a salt thereof with a compound of the formula:



or its salt to provide a compound of the formula:



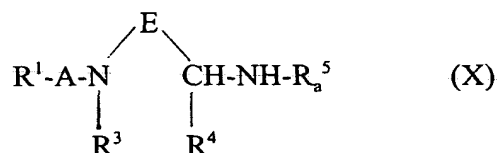
or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A, E, X and  $\text{Q}_a$  are each as defined above, and

$\text{R}^7$  is lower alkyl, lower alkenyl, lower alkynyl, cyclo(lower)alkyl, aryl, or a heterocyclic group, each of which may be substituted with suitable a substituents(s), or



Appl. No. New Application

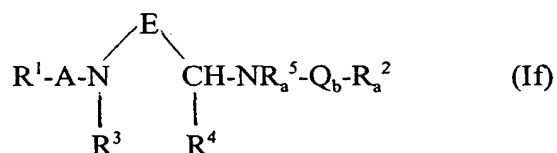
7) reacting a compound of the formula:



or its salt with a compound of the formula:



to provide a compound of the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A and E are each as defined above,

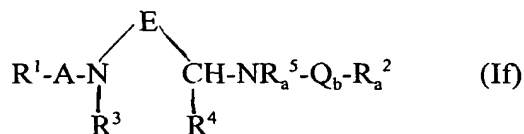
$\text{R}_a^5$  is an N-protective group,

$\text{R}_a^2$  is lower alkyl, lower alkenyl, lower alkynyl, cyclo(lower)alkyl, aryl, or a heterocyclic group, each of which may be substituted with suitable a substituents(s),

$\text{Q}_b$  is  $-\text{CH}_2-$ ,  $-\text{CO}-$ ,  $-\text{SO}_2-$ , and

$\text{Z}_a$  is an acid residue, or

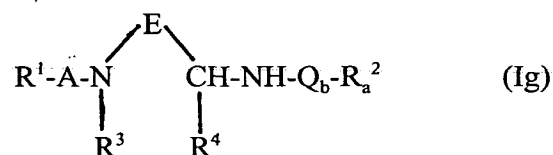
8) subjecting a compound of the formula:



or its salt to elimination reaction of the N-protective group to provide a compound of

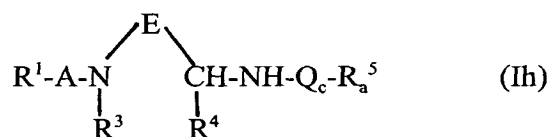
Appl. No. New Application

the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}_a^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A, E and  $\text{Q}_b$ , are each as defined above, or

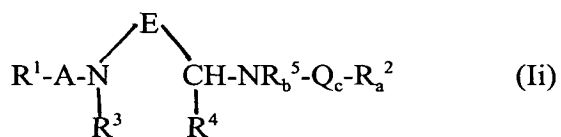
9) reacting a compound of the formula:



or its salt with a compound of the formula:



to provide a compound of the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}_a^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A and E are each as defined above,

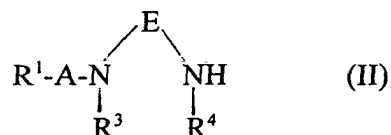
$\text{Z}_b$  is an acid residue,

$\text{Q}_c$  is  $\text{-CO-}$ , and

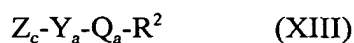
$\text{R}_b^5$  is lower alkyl, or

Appl. No. New Application

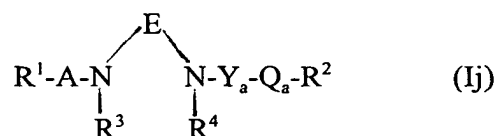
10) reacting a compound of the formula:



or its salt with a compound of the formula:



to provide a compound of the formula:



or its salt, in the above formulas,  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$ ,  $\text{R}^4$ , A, E and  $\text{Q}_a$  are each as defined above,

$\text{Z}_c$  is an acid residue, and

$\text{R}_b^5$  is lower alkylene.

Claim 9. (Currently Amended) A pharmaceutical composition, comprising:

a compound of Claim 1, as an active ingredient, in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

Claim 10. (Canceled)

Claim 11. (Currently Amended) A method for the therapeutic treatment ~~and/or~~ prevention of amnesia, [or] dementia or schizophrenia, which comprises:  
administering an effective amount of a compound of Claim 1 to mammals.

Appl. No. New Application

Claim 12. (Canceled)